

# 國立中山大學 102 學年度碩士暨碩士專班招生考試試題

科目名稱：計算機概論【資管系碩士班甲組、丙組】

題號：442001

※本科目依簡章規定「不可以」使用計算機

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(A) 共 16 題：1~14 單選題，15~16 複選題。每題 5 分。

- Which of the following statements is true?
  - Increasing degree of multiprogramming may result in thrashing.
  - Caching can solve thrashing problem.
  - Demand paging is suitable for loading operating system kernel.
  - Segmentation memory access scheme has the same segmentation problem as paging.
  - None of the above.
- Which of the following statements about networking is **NOT** true?
  - A sender in data link layer does not need to know the receiver's address.
  - There is no routing path concept in data link layer.
  - ARP is used to resolve the mapping from IP address to its MAC address.
  - DNS is used to resolve the mapping between IP address and domain name.
  - None of the above is true.
- Which of the following statements about object oriented programming is **NOT** true?
  - Polymorphism allows an object to be accessed in more than one data type.
  - Encapsulation can be used to ensure that sensitive data can only be changed within the scope of the class itself.
  - Overriding a method redefines the method with the same return type and parameters.
  - Inheritance reduces code development effort.
  - None of the above is true.
- Which of the following statements about recursion is **NOT** true?
  - A recursive program contains a segment of code for base case(s) and that for recursive case(s).
  - Recursive program often generates shorter program than the iterative version.
  - Recursion looks backward through convergence on a base case.
  - Recursion makes the program execution efficiently.
- Which of the following statements about binary tree is **NOT** true?
  - The maximum number of nodes on level  $k$  is  $2^{k-1}$ , given that root is at level 1.
  - A complete binary tree with  $n$  nodes has the height of at most  $\log n$ .
  - Traversal of a binary tree with  $n$  nodes has the time complexity of  $O(n \log n)$ .
  - The maximum number of nodes in a binary tree of level  $k$  is  $2^k - 1$ .
  - The height of a tree is a height of the root.
- Which of the following statements about network is true?
  - The subnet mask is 255.255.240.0 for a Class B to have 32 subnets.
  - The subnet mask of 255.255.255.224 partitions a Class C network into 8 subnets.
  - The maximum number of subnets for a Class B network is 256.
  - None of the above.
- The postfix expression of  $A+(B-C)*D-E$  is
  - ABC-D\*+E-
  - ABC-+D\*E-
  - +A\*-BCDE
  - ABCD\*-+E-

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8. When planning database design, the process of minimizing data redundancy to reduce the possibility of update anomalies is called
  - (A) Atomicity
  - (B) Normalization
  - (C) Indexing
  - (D) Concurrency control
9. The class of problems known as NP-hard is so named because it is composed of which of the following?
  - (A) Non-deterministic polynomial problems
  - (B) Non-polynomial problems
  - (C) Non-programmable problems
  - (D) Non-universal problems
10. Which of the following approaches in processor architectures highly depends on the compiler optimization of code generation to exploit instruction level parallelism?
  - (A) out-of-order execution
  - (B) very long instruction word
  - (C) superscalar
  - (D) pipelining
11. Which one of the following is not a wireless wide area network technology?
  - (A) UMTS
  - (B) LTE
  - (C) WiMAX
  - (D) Ultra-wideband
12. Which of the following features of C++ will perform machine-code level operations?
  - (A) function
  - (B) class
  - (C) run-time type identification
  - (D) pointer
13. Normally, a “64-bit” computer means the size of which one is 64-bit?
  - (A) hard-disk
  - (B) register
  - (C) color depth
  - (D) DRAM bandwidth
14. Which of the following data structures is suitable for handling recursive calls?
  - (A) Hash
  - (B) Set
  - (C) Queue
  - (D) Stack
15. (複選) Which of the following could be possible time complexity of the quick sort algorithm?
  - (A)  $\theta(n \log n)$
  - (B)  $\theta(n)$
  - (C)  $\theta(n^2)$
  - (D)  $\theta(\log n)$

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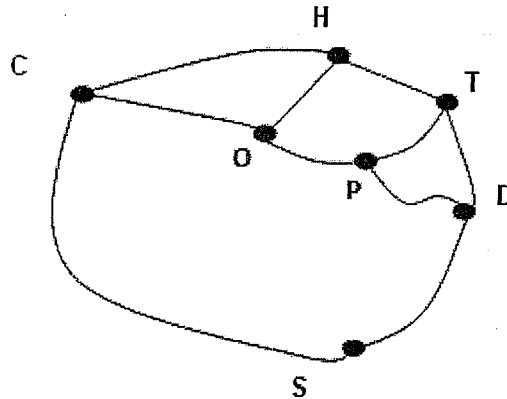
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16. (複選) Which of the following are found paths of breath-first search?  
(A) HOC (B) HCS (C) TDP (D) THO



## (B) 問答題

1. (10%) Given the program below. (A) What is the output of 407? (B) Please explain what the program does.

```
#include <stdio.h>
main()
{
    int number, sum = 0, temp, remainder;
    printf("Enter a number\n");
    scanf("%d",&number);
    temp = number;
    while( temp != 0 )
    {
        remainder = temp%10;
        sum = sum + remainder*remainder*remainder;
        temp = temp/10;
    }
    if ( number == sum )
        printf("Is an armstrong number.");
    else
        printf("Is not an armstrong number.");
}
```

2. (5%) Is Java a compiled or interpreted language? Explain your answer.
3. (5%) In C programming language, given a variable  $a=3$ , what is the value of the evaluation  $a++a$ ? Explain.

